RE: Advanced Vadose Zone Characterization Workshop, January 19 –21, 2000

Dear Colleague:

At the USDOE's Hanford Site, a significant fraction of the known contaminant inventory is in the vadose zone and some species are moving to groundwater at rates exceeding those predicted by traditional vadose zone models. Interpreting existing contaminant plumes and predicting the fate and transport, in the very least, will require knowledge of the average *in situ* hydraulic properties, as well as the magnitude and characteristic length scales of the variations of those properties. However, our current knowledge of the constitutive relationships for vadose zone sediments are limited to cores obtained at isolated locations. Current monitoring technologies have made use of the more than 700 steel-cased monitoring wells on site but account for less than one percent of the estimated inventory and are incapable of detecting many of the more mobile species. Techniques used for measuring hydraulic properties are mostly invasive and provide only local scale, near-surface measurements. Thus, our ability to determine spatial-scale dependence and to establish relationships between hydraulic properties and observed flow and transport phenomena, especially at the field-scale transport, have been somewhat limited.

In Fiscal year 1998, the Hanford Groundwater/Vadose Zone Integration Project was established to develop a holistic approach to managing projects focussing on the impacts of contamination on the vadose zone, groundwater, and the Columbia River. As part of this project a Vadose Zone Test Facility (VZTF) is being established to allow the performance of several large-scale flow and transport studies and to serve as a test bed for advanced characterization and monitoring technologies with potential for application in the vadose zone at the Hanford Site. It is expected that the VZTF studies, when coupled with the advanced characterization technologies, will lead to an improved understanding of vadose zone processes and ultimately the development of improved conceptual and numerical models to be used in risk assessment and the evaluation of remediation options at Hanford.

On January 19 –21, 2000, the Pacific Northwest National Laboratory will be hosting an Advanced Vadose Zone Characterization Workshop at the Hanford Site in Richland, Washington. This workshop is intended to bring together experts in characterization and monitoring technologies from Industry, Universities and the National Laboratories with the following objectives in mind:

- to identify new or emerging technologies with potential for use in the vadose zone at Hanford
- to understand the advantages and limitations associated with use of these technologies
- to determine the requirements for deploying these technologies at the VZTF and ultimately across the site

You are invited to participate in this workshop and to share with us you expertise in one or more of the following areas:

- Accessing and sampling deep unsaturated sediments
- In situ measurements of contaminants, particularly radionuclides
- In situ characterization of hydrologic and solute transport properties
- In situ characterization of flow and transport processes, including geochemical interactions
- Burial ground characterization
- Tank leak detection and monitoring

For monitoring and characterization, the interest is in, but not limited to, technologies that can make use of existing infrastructure, including the steel-cased boreholes.

The workshop will include a series of 20 minute presentations by participants followed by detailed discussions of the various technologies and their potential for incorporation into the VZTF studies. You will be receiving more information on the agenda and schedule by early January 2000.

Your participation is critical to the success of the workshop and the remediation efforts at Hanford. Thus, I look forward to receiving a positive response regarding your attendance. Please indicate your ability to attend and a brief title summary by sending me an email at andy.ward@pnl.gov by December 22, 1999.

Sincerely,

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